

**Torpedo Boats for Men-of-War.**

Considerable interest is being taken in the new torpedo boats which are now being constructed, two at the New York navy yard for the Maine and two others at the Norfolk navy yard for the Texas. The boats are built as light as possible, so that they can be easily hoisted on board the large vessels. The torpedo boats will be operated entirely from the men-of-war as regards supplies, only a ton of coal at most being carried. The general dimensions of the boats are as follows:

	Maine. Ft. In.	Texas. Ft. In.
Length over all.....	61 8	50 0
Length on load water, fine.....	58 6	48 1½
Beam at water line.....	9 0½	9 0½
Freeboard.....	2 5	2 3¼
Mean draught.....	2 2	2 1½
Extreme draught.....	3 3	3 4

The Maine's boats will have a displacement of 14½ tons each and the Texas' 12½ tons each.

The two boats for the Maine will each be fitted with a bow tube for discharging an 18 inch Whitehead torpedo and the two boats for the Texas will each be fitted with a deck training tube for a torpedo of the same size. Each boat will carry a 1-pounder rapid-fire gun. The engines are single vertical quadruple expansion, working at a pressure of 250 pounds. The torpedo boats will be driven at a high rate of speed. It is expected that the torpedo boats for the Maine will make 18 knots and those for the Texas 17 knots per hour. The Whitehead torpedoes weigh 875 pounds, with tube and launching gear a little over half a ton, so that a great deal of attention has been given to the question of stability. This weight being considerably above the water line, the other weights, such as the engine, boiler, fuel, etc., are so arranged that the center of gravity is as low as possible.

The results of calculations for stability are as follows: At nominal condition, ready for service, with ammunition, torpedo, and crew of five men on board:

	Maine.	Texas.
Metacentric height (feet).....	1.55	1.5
Angle of heel at maximum stability (degrees).....	43	38
Righting moment at maximum stability (ft. lb.).....	27,135	16,308
Angle of vanishing stability (degrees).....	82	73

With thirty men on deck, in addition to weight at normal condition:

	Maine.	Texas.
Metacentric height (feet).....	0.83	1
Angle of heel at maximum stability (degrees).....	35	30
Righting moment at maximum stability (ft. lb.).....	18,400	7,875
Angle of vanishing stability (degrees).....	67½	52½

Cockpits, with considerable seating capacity, have been provided, so that the torpedo boats may be used as dispatch boats if necessary.

**SCULPTURE AT THE WORLD'S FAIR.**

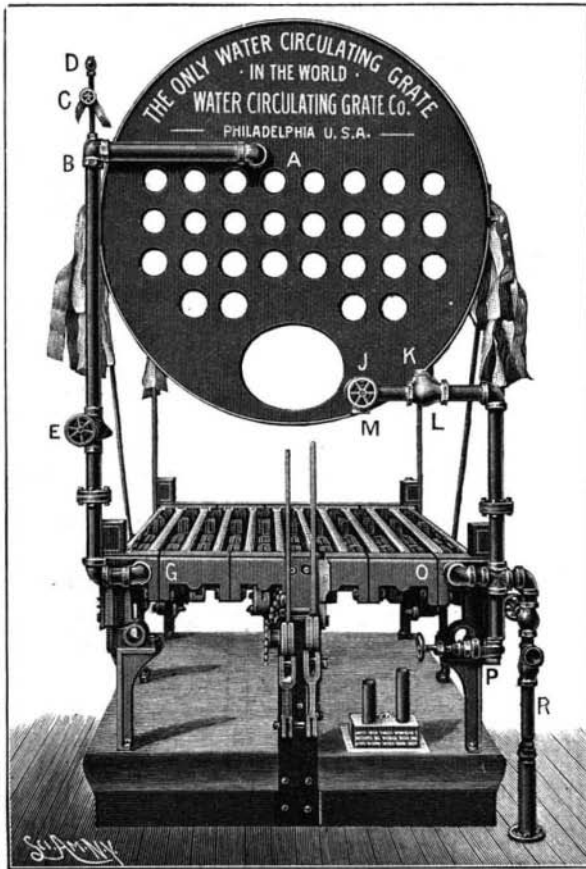
When the ephemeral glories of the Chicago World's Fair have passed away, the best of the statuary will remain a lasting memento of 1492-1892. One of the finest pieces of sculpture is illustrated on this page a group of horses drawing a chariot in which stands the triumphant Columbus with heralds on either side, surmounts the Peristyle; another is a group from the Agricultural building. Both are the work of Mr. Edward C. Potter and Mr. Daniel C. French, and are worthy of the subject and the occasion.—*Black and White (English).*

**Launch of a Great Cargo Steamer.**

The new White Star Liner Cevic recently launched is a very fine vessel, 500 feet long, 60 feet broad, and 38 feet deep, of a registered tonnage 8,315. Her total capacity of hold is 14 089 tons. She will be provided with accommodation for 800 head of cattle on upper decks, with permanent stalls for twenty horses in the center, besides having room in holds for a big cargo of other freight. The Cevic is built of steel throughout to Lloyd's highest class, and will be propelled by two screws with manganese bronze blades, driven by two complete sets of triple expansion engines. She will be lighted throughout by electricity. The scheme for ventilation on board will be as near completeness as possible. The Cevic has been built by Harland & Wolff for the White Star Line for carrying cargo and live stock between New York and Liverpool.

**THE WORLD'S COLUMBIAN EXPOSITION—EXHIBIT OF THE WATER CIRCULATING GRATE COMPANY.**

The exhibit of the Regan water circulating and shaking grate is located in the boiler house extension, Section D, Machinery Hall. This grate is designed for marine, stationary and locomotive boilers, and is adapted for all classes of fuel without change of bars.



**THE WORLD'S COLUMBIAN EXPOSITION—EXHIBIT OF THE WATER CIRCULATING GRATE COMPANY.**

No artificial draught is required, and the circulation is designed to keep the boilers clean. The operation of the grate is as follows:

R is the feed pipe; O is where the water enters the grate from the feed; M is a valve to shut off blowing surface blow; L is a reversed check which closes when feeding, and supplies the grate with water; J and K are the connections which go through the boiler front and connect on to the bottom of the boiler; G is where the feed water comes out of the grate on its way to the boiler; E is a valve which is to be shut when blowing from the bottom; A is where the water is delivered into the boiler, through an inside pipe, nine feet in length; B, C and D is an air check which

the grate, running through one bar and then another, coming out at G; it then passes up the pipe to A, and enters the boiler at the top under the water line, through an inside pipe which carries the water and delivers it at about the middle of the boiler. The moment feeding stops, the check, L, is opened from the pressure from boiler, and the water from bottom of boiler takes the place of the feed which is cut off. To blow the grate, open P and shut M; this gives a surface blow from the top of boiler, passing through the grate, keeping it clean of all sediment; as soon as the surface blow has been used enough, let P remain open and open M; now the blowing is at the top and bottom at the same time; the bottom one is sucking the mud from bottom of boiler; shut P, and circulation commences at once. M and E always remain open unless blowing, as they are the two main lines of circulation from grate to boiler.

This grate is made by the Water Circulating Grate Company No. 1028 Filbert St., Philadelphia, Pa. It has been patented in England, France, Germany, Austria, Spain, Belgium, and Italy, as well as in the United States.

**Completion of the Mont Blanc Observatory.**

The observatory on the top of Mont Blanc is at last completed. The work was facilitated by the use of windlasses, which drew the materials up the icy slopes. Some of the builders remained on the summit for twenty days, the August weather being very favorable. The construction of the observatory was begun over two years ago. The builders hoped to cut through the ice cap to solid rock, but this was found to be impossible, after they had gone down a distance of thirty or forty feet. So at last it was determined to let the building stand upon the ice and snow. The observatory was made in sections at Paris, under the immediate direction of Mr. Janssen. The pieces were transported to Rochers-Rouges on the backs of men, and were finally brought to the summit by the aid of windlasses. The building is thirty-eight feet high, but only one-third is above the snow. The upper story is used exclusively for observatory purposes, while the lower stories shelter attendants and parties of tourists. The observatory rests on ten heavy screws, so that the building can be easily leveled. The interior is lighted by small dormer windows with double panes of thick glass. All wood used in the construction is fireproofed, and all necessary precautions against fire have been taken. Anthracite coal will be burned. It is seldom that the cold exceeds thirty-two degrees below zero. The observatory will be occupied from May to November, and a great deal is expected from the self-registering instruments during the winter. If possible, it is intended to connect the instruments with Chamounix by electricity, but no steps toward this end have been taken yet. M. Janssen was carried to the top of Mont

Blanc last year in a litter borne by thirteen porters. The new observatory will enable scientists to carry out important experiments and observations in physics, meteorology, spectrum analysis and vegetable and animal physiology.

**Phosphorescent Minerals.**

Mr. Jacksh, of Trieste, Moravia, as quoted by the *Popular Science Monthly*, names four sulphurets which become phosphorescent after a brief exposure to daylight—the sulphurets of calcium, strontium, barium and zinc. The last compound has been obtained in a luminous condition only recently by distillation in a vacuum. Prepared in the usual way, by precipitating soluble salts of zinc with sulphurets, it shows no signs of phosphorescence. Sulphuret of barium gives a yellowish orange glow, but only for a few minutes after each exposure to the light, and is of as little use as the sulphurets of stron-



**SCULPTURE AT THE WORLD'S FAIR—STATUE OF COLUMBUS ON THE PERISTYLE.**

tium and of zinc, the greenish glow of which disappears after about two hours. For practical uses the sulphuret of calcium of commerce is the only phosphorescent of value. Pure, it gives a faint yellowish light, but treated at a red heat, with the addition of a small quantity of a salt of bismuth, it is transformed into a substance giving a violet light and retaining its luminous quality for nearly forty hours after an exposure of only a few seconds.